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# *Starpharma Holdings Limited*

ASX:SPL  
USOTC:SPHRY

October 2006

Dr Jackie Fairley – CEO

## “Top Nanotech Buys for 2005”

*“We expect great things to come from the company and its significant ownership in U.S.-based Dendritic Nanotechnologies, Inc.”*

Forbes/Wolfe 2005

## “Growth Strategy Leadership Award in the World Nanobiotechnology Market”

Frost and Sullivan July 2005

*This presentation contains forward-looking statements that involve risks and uncertainties. Although we believe that the expectations reflected in the forward-looking statements are reasonable at this time, Starpharma can give no assurance that these expectations will prove to be correct. Actual results could differ materially from those anticipated, because of various important factors, risks and uncertainties. These include risks associated with drug development and manufacture, risks inherent in the extensive regulatory approval processes mandated by regulatory authorities, delays in clinical trials, future capital needs and general economic uncertainty. Also, there can be no assurance that others will not independently develop similar products or processes or design around patents owned or licensed by the Company, or that patents owned or licensed by the Company will provide meaningful protection or competitive advantages.*

1. Introduction and Company Overview
2. VivaGel™ – Product Overview and Market Opportunities
3. The Acquisition of DNT
4. Integrated Pipeline
5. Conclusion

# *1. Company Overview*

*Announced October 4, 2006*



## **Starpharma to Acquire Dendritic Nanotechnologies, Inc.**

**Melbourne, Australia, 4 October 2006** – Starpharma Holdings Limited (ASX:SPL, USOTC:SPHRY) today announced the signing of an agreement to acquire US-based Dendritic Nanotechnologies, Inc. (DNT) for US\$6.97m (A\$9.36m) through the issue of Starpharma shares. This attractively priced transaction offers significant benefits to Starpharma including:

- the provision of diversified product pipeline with near-term cash-flow opportunities, and a more balanced risk profile;
- an increased US presence;
- The Dow Chemical Company will become a substantial shareholder in Starpharma (approximately 8.6%);
- significant development, commercialisation and other business synergies; and
- an extensive IP portfolio with existing royalty streams.

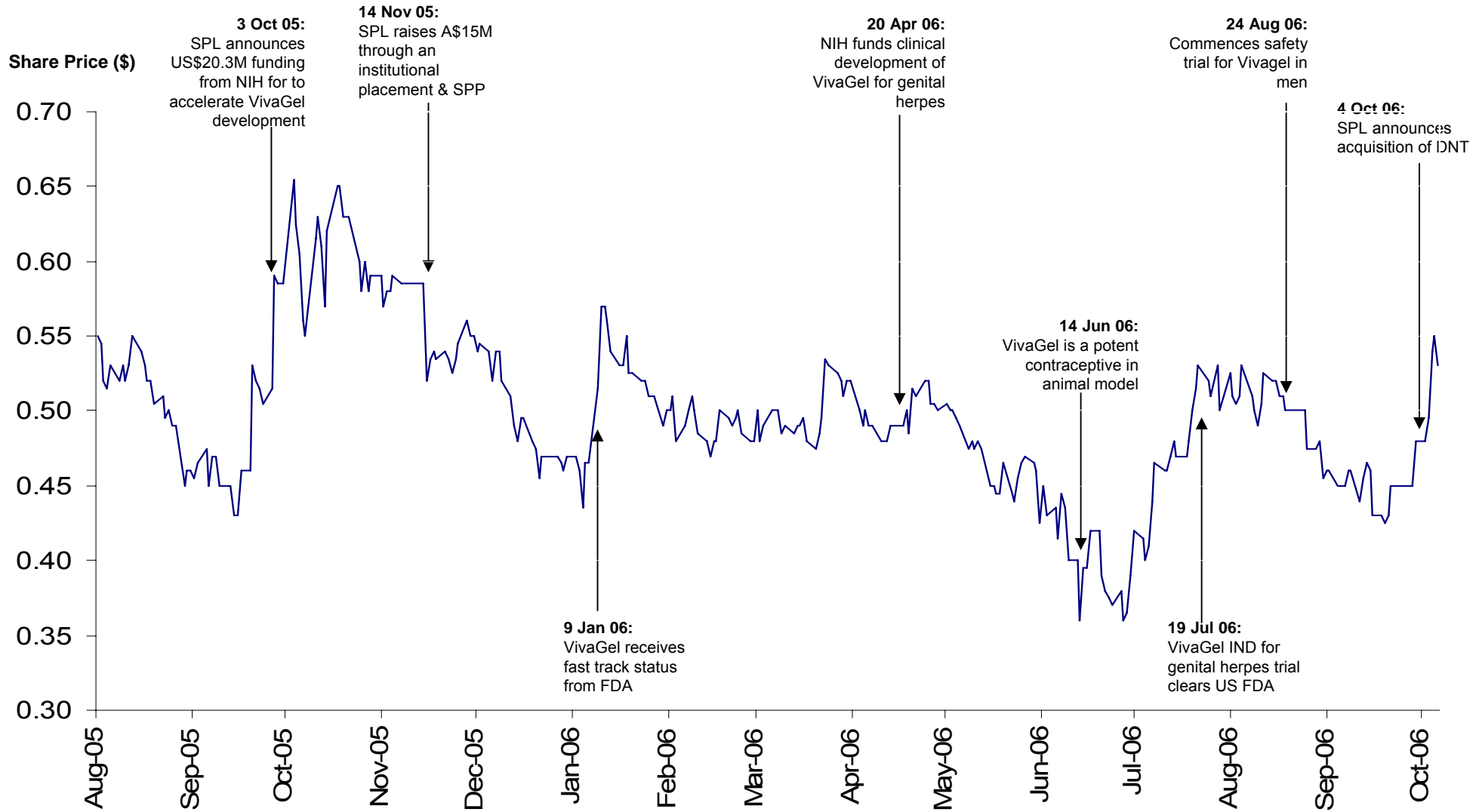
**This presentation describes the combined company, in anticipation of the completion of the transaction (expected approx 20 October.)**

## *Starpharma Holdings Ltd: Company Overview*

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- Headquartered in Melbourne, Australia
- ASX Listed **ASX:SPL** ; 9.7% issued capital via **USOTC:SPHY**
- World leader in the development of **dendrimer nanotechnology products** for pharmaceutical and life-sciences
- Starpharma's lead product, **VivaGel™** is being developed (under IND) as a microbicide to prevent HIV and Genital Herpes
  - US\$20.3m NIH funding to develop VivaGel™ for HIV
  - FDA Fast Track Status for HIV
  - VivaGel™ the first microbicide with NIH funding support for Genital Herpes
- Broad portfolio of other dendrimer projects
- Acquisition of US-based company DNT Inc. (October 4, 2006)
- Successful Level 1 ADR Program : 9.7% issued capital (Sept. 2006)

# Starpharma: Share Price History



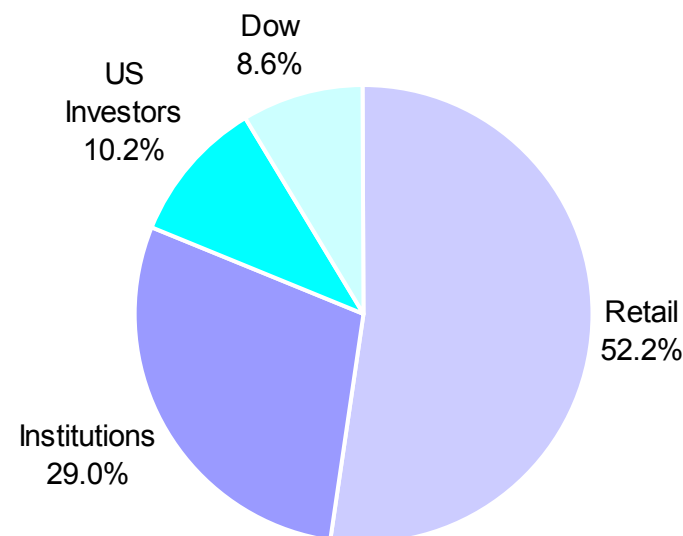
**Conclusion: SPL share price does not reflect value of underlying achievements in the past 12 months**

# Shareholder Composition and Financial Statistics

## Starpharma Holdings Limited Post DNT Transaction

<b>ASX Code:</b>	<b>SPL</b>
<b>Level 1 ADR Code:</b>	<b>SPHRY</b>
<b>Shares on Issue:</b>	<b>167.8M</b>
<b>Market Cap:</b>	<b>~ A\$85M (US\$65M)</b>
<b>Share Price:</b>	<b>A\$0.51</b>
<b>12 Month High/Low:</b>	<b>A\$0.67 / A\$0.35</b>
<b>Average Volume:</b>	<b>4.4M shares per month</b>
<b>Major Shareholders:</b>	<b>Dow: 8.6%</b>
	<b>Acorn: 6.1%</b>
<b>% SPL held in ADR:</b>	<b>8.5%</b>
<b>% US shareholders:</b>	<b>18.8%</b>
<b>Cash (Jun 06):</b>	<b>A\$14.3 (US\$10.7)M</b>

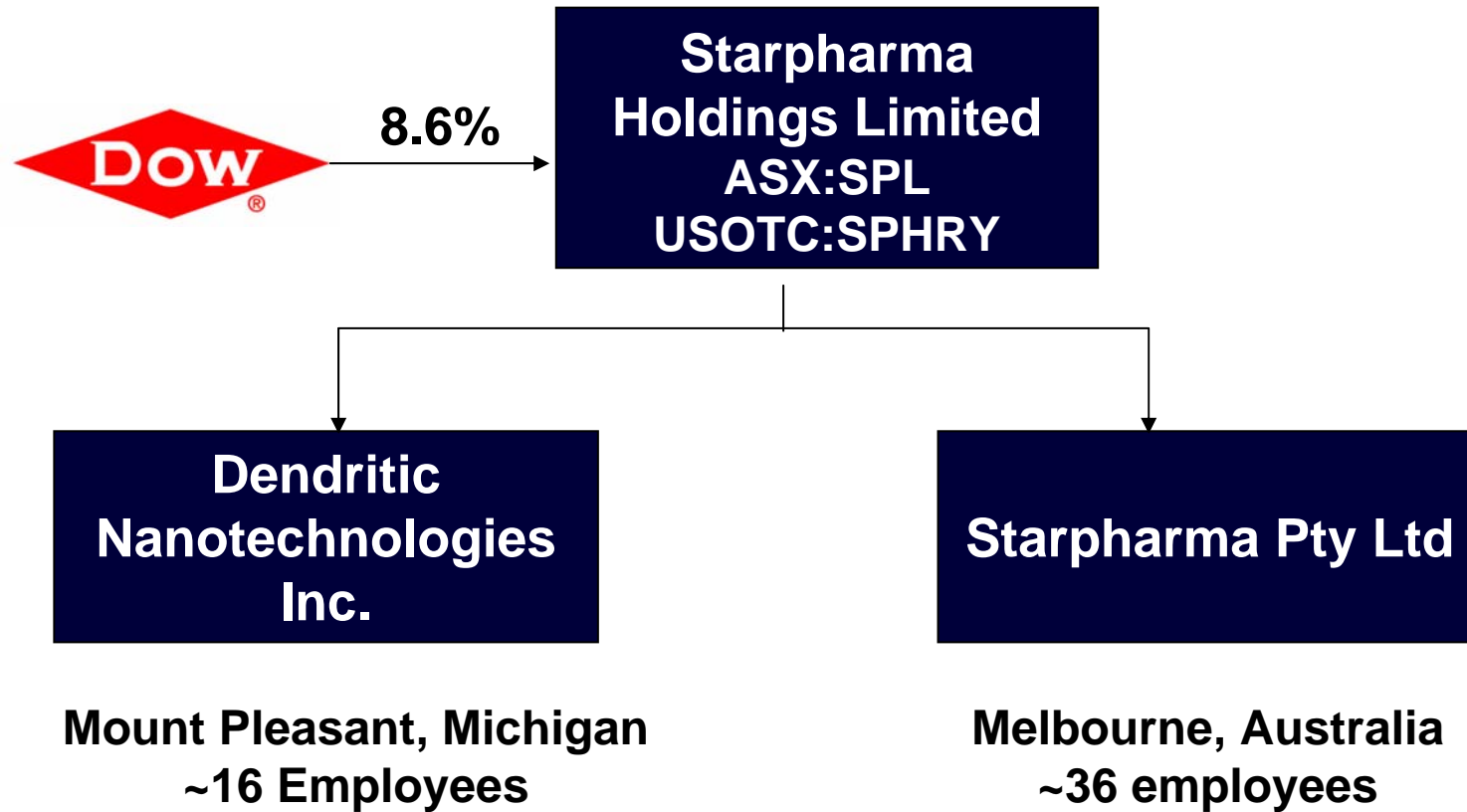
## Shareholder Register



Following the DNT transaction Starpharma will have a significant US shareholder base



# Post Transaction Company Structure



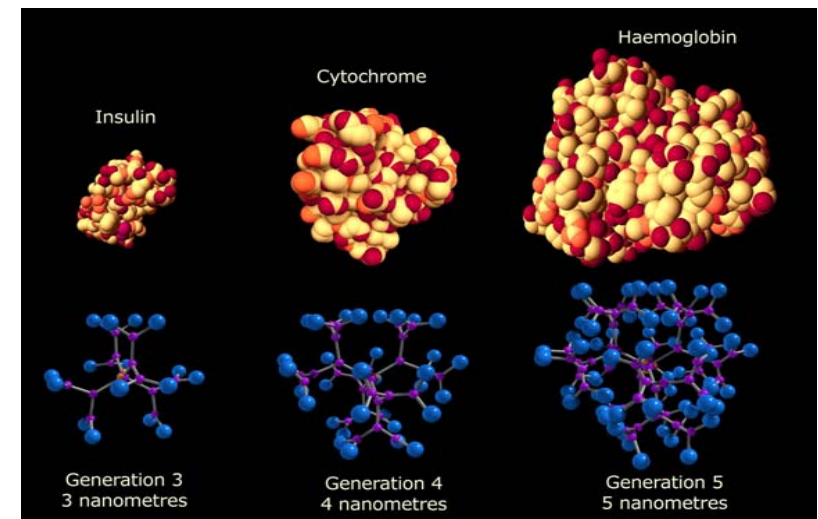
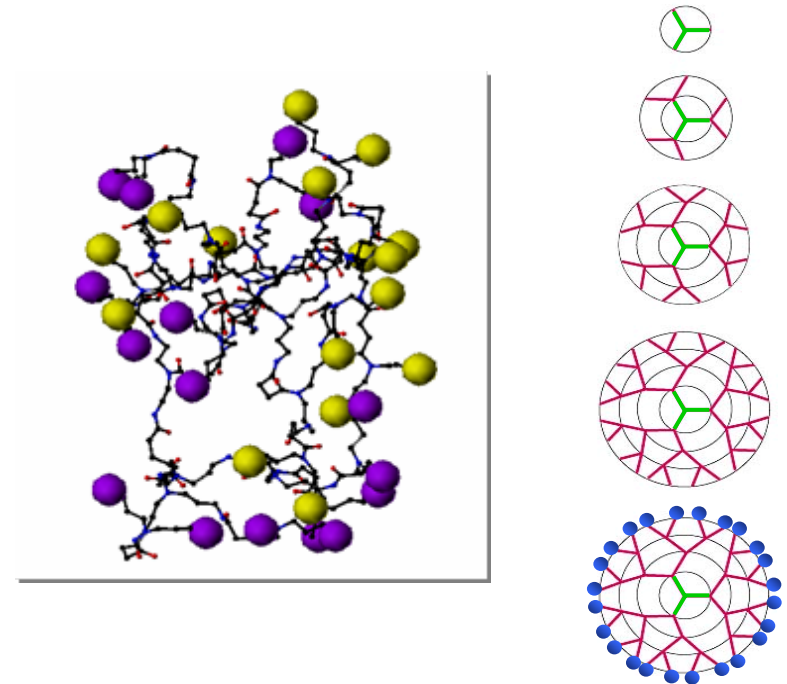
\* Acquisition of DNT announced 4 October 2006,  
Completion expected 20 October 2006

## Unique Characteristics of Dendrimers:

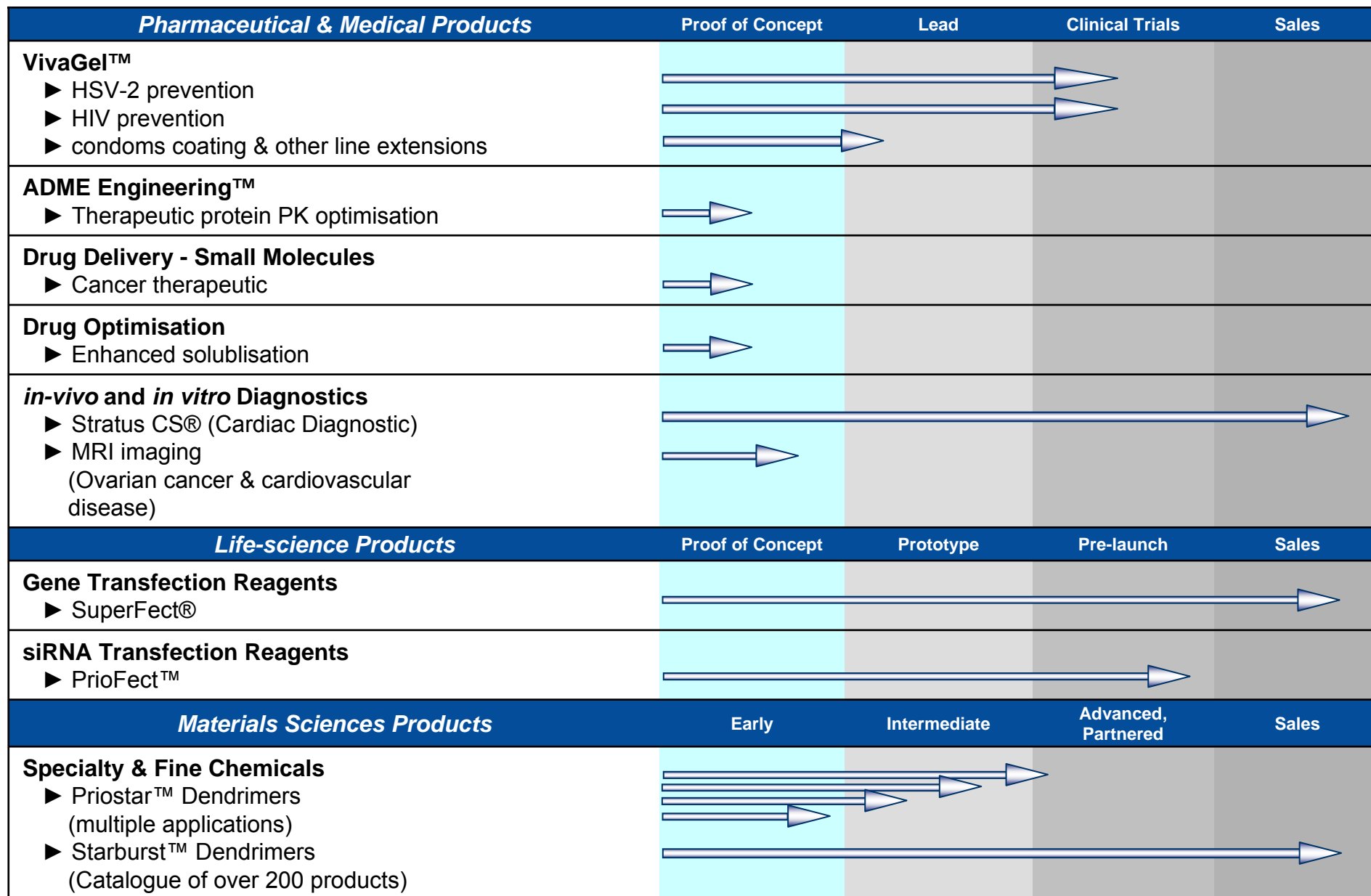
- Precisely defined, synthetic macromolecules (1-10nm, 5-50kD)
- Precisely defined surface topology
- Can be designed to optimize potency, pharmacokinetics and localization
- Different species can be heat stable or biodegradable
- High multivalent binding affinity
  - ability to disrupt protein-protein interactions

## Commercial Advantages of Dendrimers:

- Key enabling nanoscale technology
- Diverse range of pharma, diagnostic & materials applications
- In the clinic – VivaGel™ ( the first dendrimer IND)
- Scalable chemical manufacturing process with competitive COGs
- Well tolerated



# Integrated Pipeline: Balanced for Risk



## *2. VivaGel™*

### *Product Overview*

## *VivaGel™ – Lead Product for Prevention of STIs*

### VivaGel™ packaged into pre-filled applicators.



- VivaGel™ is a microbicide being developed to prevent sexually transmitted infections (STIs) in women
- VivaGel™ is a gel-based formulation with a nanotech active, delivered privately via an applicator prior to sexual activity
- The active ingredient of VivaGel™ (SPL7013) inactivates HIV and HSV-2 (genital herpes) virus by binding with the virus preventing it attaching to the host
- Vaccines against HIV and genital herpes have thus far failed and there is a significant and growing recognition that microbicides offer the best alternative

**VivaGel™ offers an attractive first line defence against the spread of HIV and genital herpes**

## *VivaGel™ : Summary*

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- Topical microbicide gel with nanotech (dendrimer) active being developed under 2 INDs for the prevention of:
  - HIV and Genital Herpes (HSV-2) where other prevention strategies have failed
- Compelling competitive advantages: efficacy; non-irritant; broad activity\*
- Successfully completed Phase 1 trial in Humans
- Further human studies underway; others to commence shortly in Australia, USA and Africa
- US\$20.3m non-dilutive NIH funding for development in HIV (without downstream commercial obligations)
- Granted FDA Fast Track Status for HIV
- The only microbicide funded by the NIH for Genital Herpes (clinical development, undisclosed sum)
- Contraceptive in animal studies
- Significant commercial opportunity
- 2 line extensions: condom coating and in combination (ComboGel)

## *Genital Herpes – Nasty, Incurable Disease*

- Genital herpes is the “un-recognised pandemic” of the industrialised world
  - **22%** of the US adult population has genital herpes; Est. cost (US) >\$1.5B pa
  - Without intervention the prevalence of genital herpes in the US is expected to increase to **39%** of men and **49%** of women by 2025
- Infection is life-long, drugs do not cure
- Results in painful blisters/ulcers
  - Ulcers last 3-4 weeks; 4-5 ulcerative episodes p.a
  - Increases affected individuals’ risk of HIV infection by 4-8x
- May be transmitted by individuals who have no visible ulcers
- Transmissible at birth:
  - Ocular, neurological and respiratory disease
  - Long term complications in 40%; death in 14%
- Existing prevention methods have proven ineffective and developmental vaccines disappointing



## Commercial Opportunity for Microbicides

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- **Large, addressable markets:**

- HIV primarily in developing countries
- HSV-2 in both developing and developed countries

***“If I had a magic bullet to accelerate something it would be the microbicide.....”***

*Bill Gates,  
July 2006*

- **Increasing market “pull” for products**

- US government firmly committed to development of safe and effective microbicides (Microbicides Development Act 2005)
- US Opinion Leaders now calling for National Herpes Control Program

- **Several industry surveys have confirmed strong consumer demand:**

- Over 20m women in US would use microbicide
- 30-40% female US college students would buy microbicide; 70% with contraceptive properties
- Strong market demand at 5x local condom price in various countries
- Microbicide market estimates >\$1.5Billion

*Source: World Bank; UNAIDs; EC AIDS survey; BCG analysis and various microbicide publications*



### *3. The Acquisition of DNT*

## *Transaction Overview*

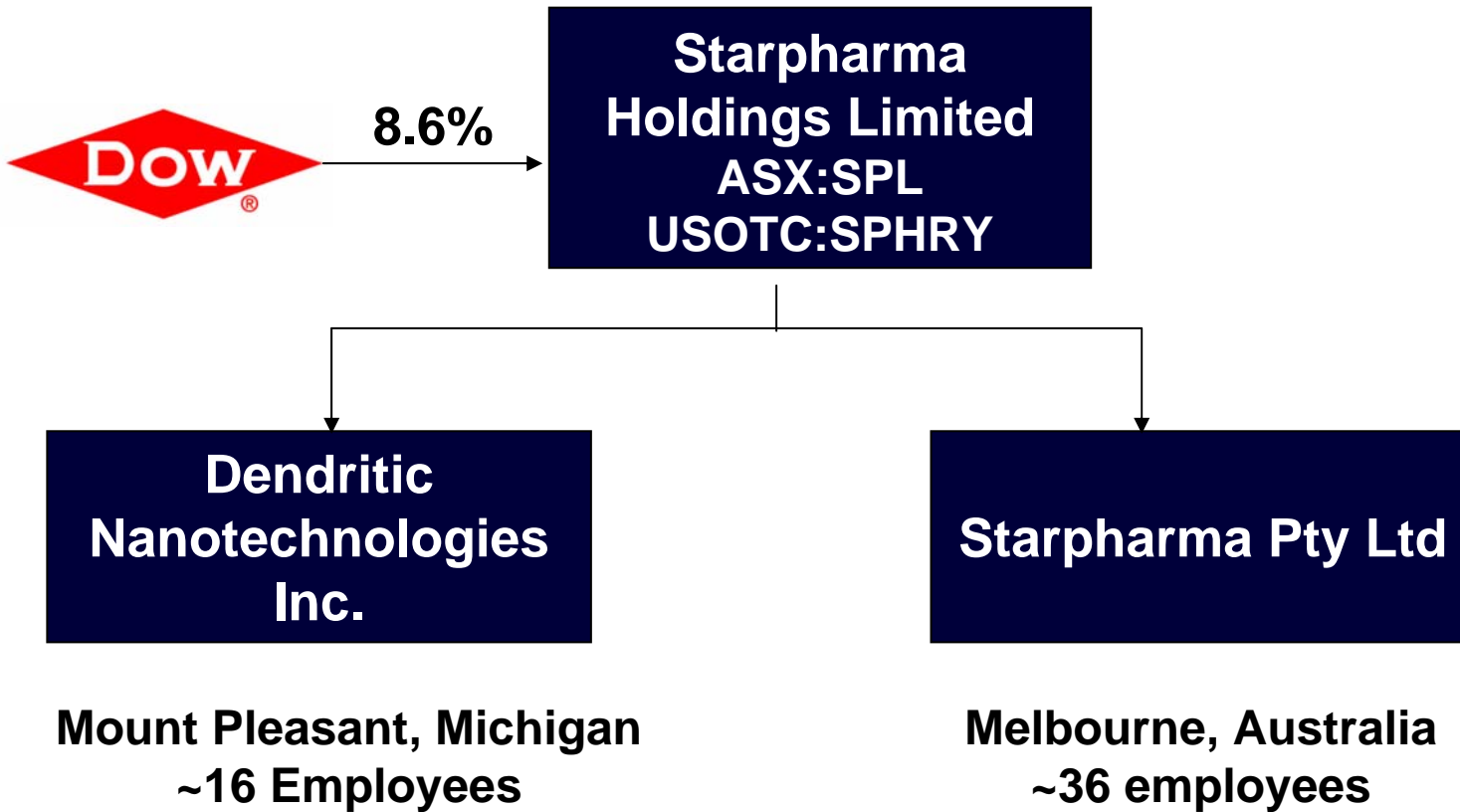
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- Prior to transaction:
- Starpharma had a 33% equity holding in the Michigan based private company Dendritic Nanotechnologies Inc (DNT)
- Transaction:
- Starpharma is acquiring the remaining 67% of DNT for ~US\$6.97 million worth of SPL shares
  - DNT is a leader in the development of dendrimers which have a broad range of life-science and industrial uses
  - The acquisition confirms Starpharma as the global leader in dendrimer-based nanotechnology
    - diverse pipeline in pharma and industrial applications
    - near-term revenue opportunities
    - comprehensive IP portfolio

*“The majority of dendrimer IP is pooled in one company, DNT, which was assigned Dow’s dendrimer portfolio of 196 patents in 2005”*

*Lux Research Inc. 2006*

# Post Transaction Company Structure



\* Acquisition of DNT announced 4 October 2006,  
Completion expected 20 October 2006

## *Significant Acquisition Benefits*

### **1. Diversified Product Portfolio**

- **Marketed products, near-term revenues**
- **Diversified risk: “more shots on goal”**

### **2. Significant Development and Commercialisation Synergies**

- **Optimal leverage of internal resources including commercial, regulatory, scale-up and discovery**
- **Better value from expenditures**

### **3. Extensive IP Portfolio: Leaders in the Field**

- **Enhanced competitive position and higher profile for commercial development**

### **4. Increased US Presence**

- **Greater access and profile in the US nanotech sector:**
  - **industry partners**
  - **financial markets**
  - **funding partners**

### **5. Ongoing Dow Involvement**

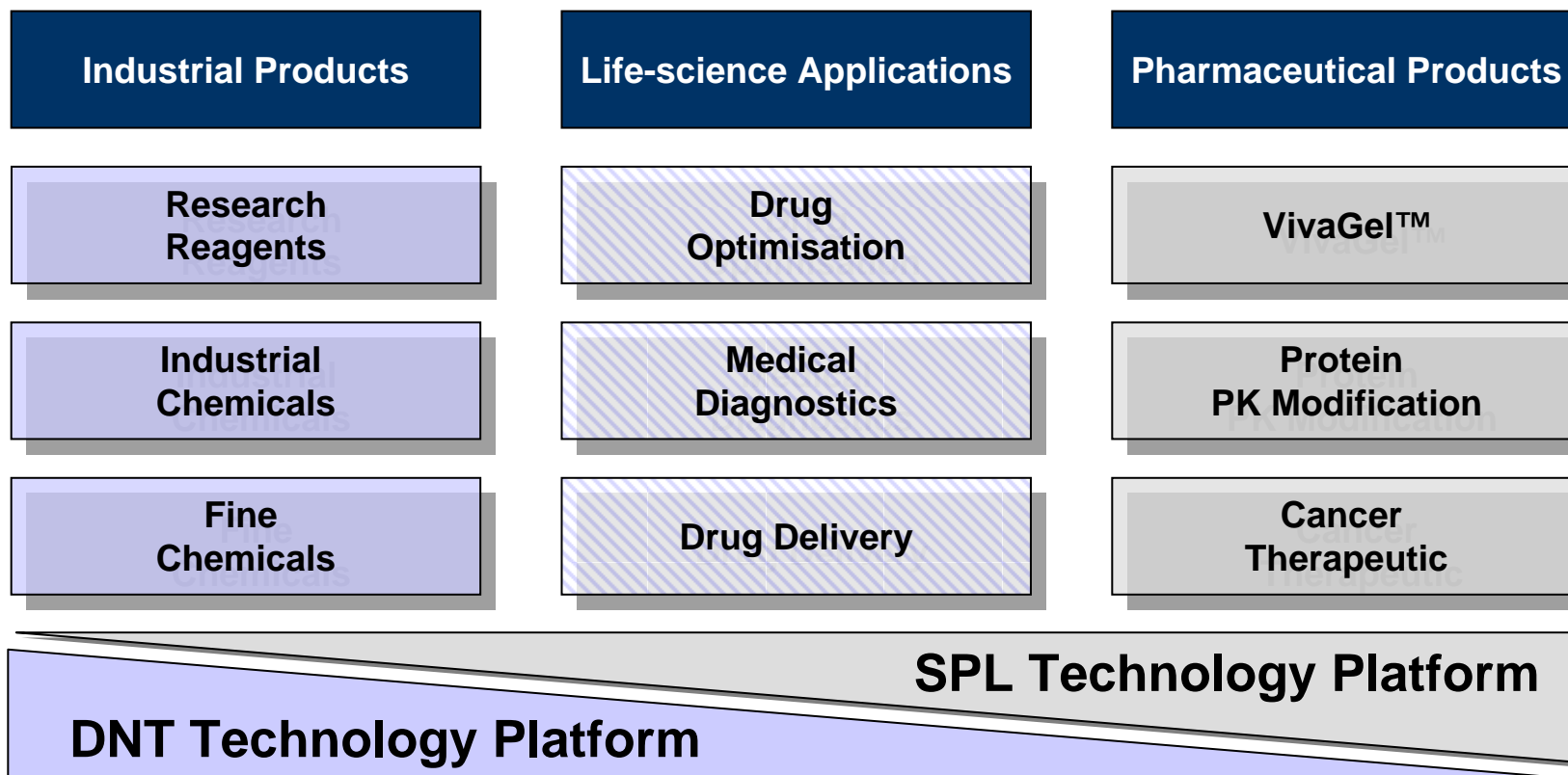
- **The Dow Chemical Company (Dow) will become Starpharma’s largest shareholder; enhances Starpharma’s profile with industry and funding partners**

### **6. Attractive Acquisition Terms**

- **Minimal dilution for Starpharma shareholders**
- **Simplifies structure and puts in place platform for creating significant additional shareholder value**

## 4. *Integrated Pipeline*

# Integrated Pipeline: Balanced for Risk



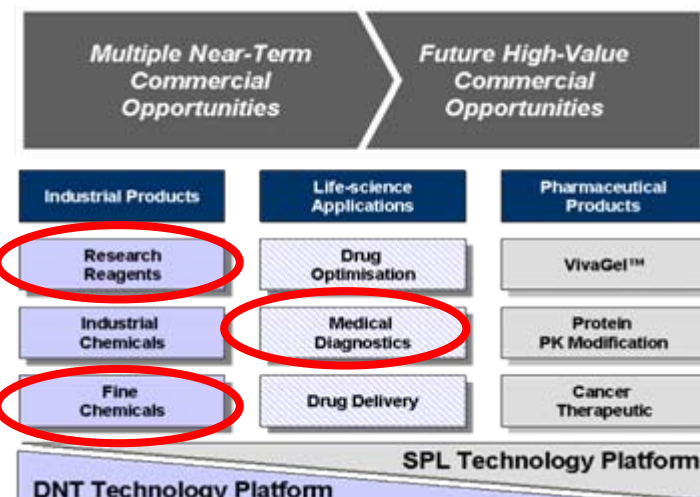
## DNT has product sales and licensed dendrimer royalty agreements

DADE BEHRING

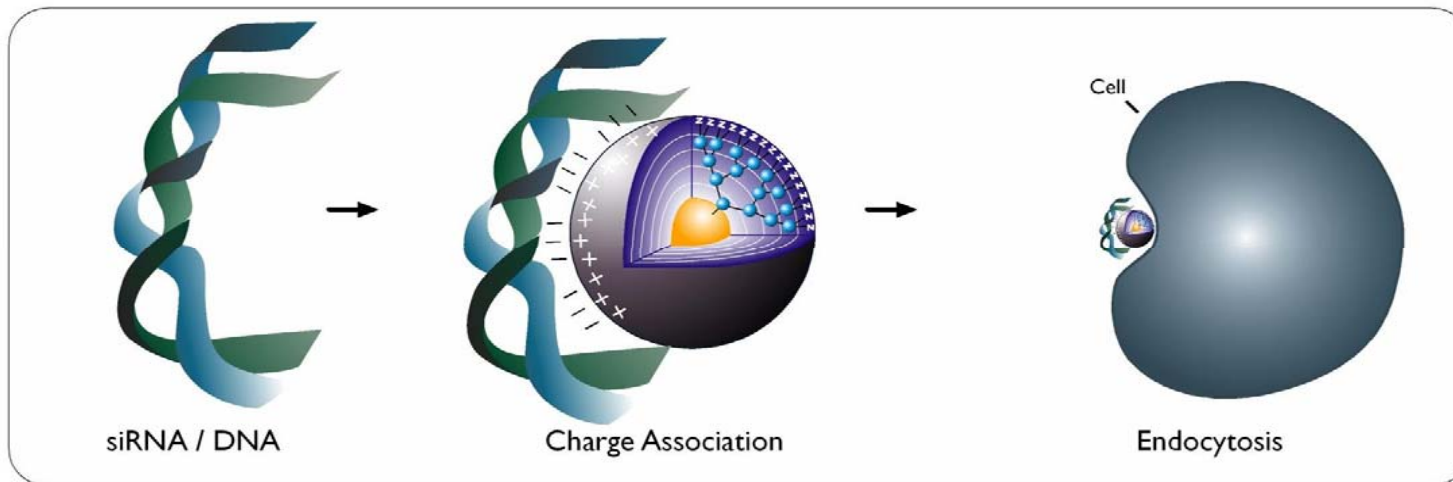
- **Stratus CS®** : Cardiac marker diagnostic licensed to Dade Behring, leading diagnostic company
- **SuperFect®** : Gene transfection technology licensed to Qiagen, #1 supplier of niche molecular biology reagents to the life sciences sector



- **Priostar™** and **STARBURST®** dendrimers commercially available



# Pipeline: PrioFect™ siRNA transfection agents

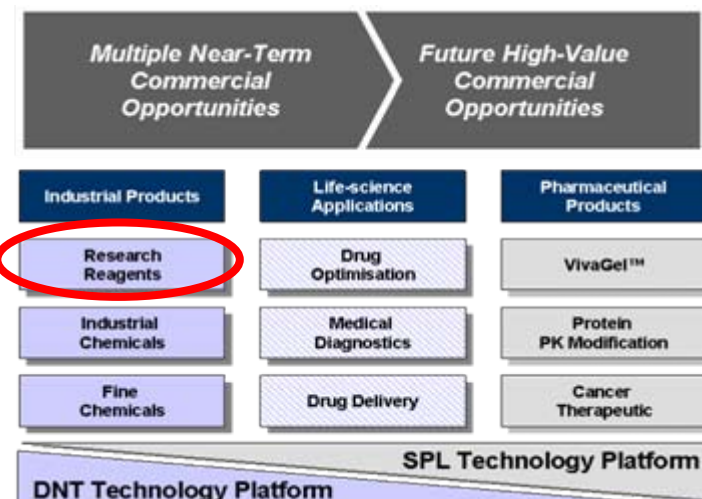


■ Transfection reagent sales : \$120 million in 2004, growing by 15-18% pa<sup>1</sup>

■ PrioFect™ siRNA Transfection Reagents provide:

- Precise size control: allows optimisation according to cell type
- Highly functionalised surface: allows targeting to specific cell types i.e. cell-specific delivery
- Pharmaceutical Quality: Low toxicity

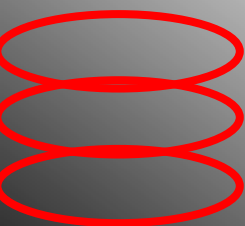
**Estimated market entry: Early 2007**



<sup>1</sup>(Jain PharmaBiotech Market Report: RNAi-Technologies, Markets, and Companies, 2004)



<b>Sector</b>	<b>Discussions with...</b>	<b>Application</b>
Oil	"Top 5" US Oil Company	Lubricant additives
Plastics	Large Automotive Components Manufacturer	Plastics additive
Manufacturing	Major Technology Company	Dental resins
	Multiple avenues of exploration	Adhesives
	"Top 5" European electronics manufacturer	Printed circuit board manufacturing
Cosmetics	Global Healthcare Company	Solubalisation
	Cosmetic Company	Adhesive
Fine Chemicals	Major fine chemical manufacturer	Laboratory reagents
Resources	Water quality specialists	Water filtering / remediation



Industry Collaborators



DADE BEHRING



Research/Uni. Collaborators



INSTITUTE FOR SOLDIER NANOTECHNOLOGIES



CALTECH



## *5. Conclusion*

- >US\$26m\* non-diluting funding from the NIH for lead development
- VivaGel™ - the only microbicide with NIH funding for genital herpes
- Significant US shareholder base and profile:
  - The Dow Chemical Company largest shareholder (8.6%)
  - Successful ADR program ~ 9.7% shares on issue pre-transaction (Sept 06)
  - US subsidiary with marketed products and extensive commercial relationships
- Diversified dendrimer product and application pipeline:
  - Marketed products; near-term revenues
  - Diversified risk: pharma, life-science and industrial
  - Comprehensive IP portfolio in dendrimer-based nanotechnology



\* Two HIV grants: US\$20.3m contract + US\$5.4m grant (2004)

*Further Information:*

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*Supplementary Material*

<b>HIV Funded: A\$26 million</b>	NIH funds VivaGel™ HIV development with non-dilutive funding
<b>Genital Herpes Funded</b>	NIH funds VivaGel™ Genital Herpes Development
<b>HIV Fast Tracked</b>	US regulator FDA designated VivaGel™ a fast track product
<b>Herpes IND Cleared</b>	FDA clears VivaGel™ Genital Herpes IND
<b>Contraceptive Activity</b>	VivaGel™ shown to be a potent contraceptive in animals
<b>Future Revenues Improved</b>	Royalty for stock swap with BRI, future revenues enhanced
<b>ADRs Nearing 10%</b>	US uptake of ADRs nears 10% of SPL issued capital
<b>A\$15m Funds Raised</b>	Institutional and SPP capital raising
<b>Patent Estate Expanded</b>	Substantial program of patent filing completed
<b>Priostar™ Rolled Out</b>	DNT rolls out Priostar™ industrial dendrimer platform
<b>Acquisition of DNT</b>	SPL acquires US company DNT; Dow becomes SPL's largest holder

## *HIV – A Preventable, Life Threatening Disease*

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- Human Immunodeficiency Virus (HIV) is the virus that causes AIDS (Acquired Immune Deficiency Syndrome)
- No cure for HIV/AIDS and may be transmitted by individuals that are asymptomatic
- 39 million people living with HIV; every day 7,000 women are newly infected
- The predominant route of transmission is via heterosexual contact
- More than 50 HIV vaccines have failed and estimates are that an effective vaccine is many years away
- Although when used condoms are effective in preventing HIV, in practice they are not used consistently or correctly

**HIV and AIDS (in the US): “Direct medical costs of up to \$15.5 billion per annum”  
“AIDS is the number one cause of death in African-American women aged 25-34”**

**““HIV prevention options as of 2005 are not enough”  
best option...technologies like microbicides which women can initiate and control”**

Source: Microbicide Development Act 2005: US Senate



## VivaGel™ – Product Features and Performance

### Product Offers Several Key Advantages

Market research indicates microbicide gels will have good uptake  
Female controlled, discreet and convenient  
Compelling competitive advantages: efficacy; non-irritant; broad activity  
Contraceptive activity (in animals)

### Excellent Clinical Results in Human and Primate Trials

Human trials (IND): VivaGel™ is non-toxic and non-irritating  
Potent activity in relevant HIV strains in very tough primate trials  
Potent activity against herpes in animal trials  
Viruses appear not to develop resistance to VivaGel™

### Excellent Drug Characteristics

Lower risk development – Topical gel, external to body  
Affordable – Low manufacturing costs  
Excellent IP position  
Passes key FDA hurdle – Well defined chemical entity

## VivaGel™: NIH support (HIV and HSV-2) & FDA Fast Track

**> US\$20.3m of non-dilutive funding from NIH**

- Funding is provided without downstream commercial obligations
- Funding will allow Starpharma to do a late-stage licensing deal and thus secure advantageous terms

**Significantly 'de-risks' VivaGel™**

- NIH funding will support VivaGel's development including:
  - Clinical (HIV and now HSV-2) and non-clinical trials,
  - Scale-up of manufacturing
  - Access to world class clinical development expertise.

- FDA *Fast-Track* for VivaGel™ for HIV means:
  - Faster review of the NDA application and
  - Greater access to and input from the FDA into development program

**Strong Endorsement of VivaGel™**

- NIH selected VivaGel™ following a 12+ month evaluation period
- VivaGel™: the only microbicide NIH funded for Genital Herpes

**NIH support enhances probability that VivaGel™ will be successfully developed and commercialised**

# VivaGel™ – Excellent Market Opportunities

## Estimated Market for microbicides in Developed Countries:

Market Penetration	Average Frequency of Use per Annum		
	25x	50x	100x
2.5%	US\$365m	US\$730m	US\$1460m
5.0%	US\$725m	US\$1450m	US\$2900m
10.0%	US\$1450m	US\$2900m	US\$5800m

### Key assumptions

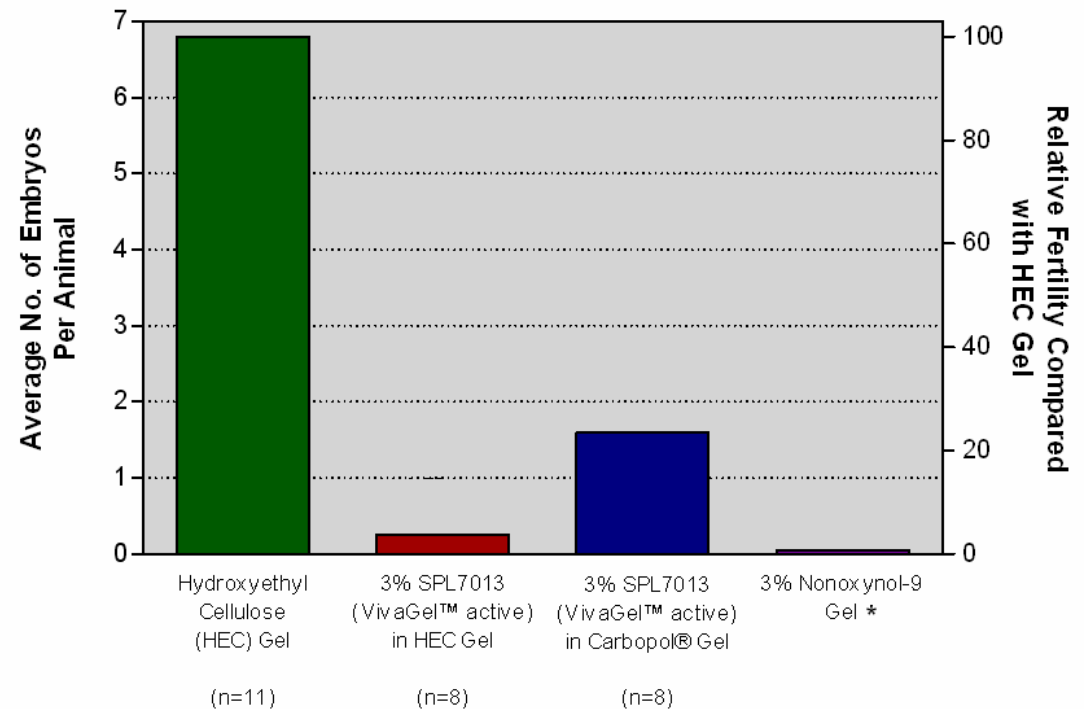
- 291m women of reproductive age (15-49) in developed countries
- Unit sale price circa US\$2
- Usage rates according to published data

	Competitor Category	Key Disadvantages	VivaGel™ Advantages
<b>HSV -2</b>	VivaGel™ is the only microbicide being developed to prevent genital herpes		
<b>HIV</b>  <b>Significant Advantages over Other Products in Development</b>	Surfactants/ Detergents	<ul style="list-style-type: none"> <li>▪ Ulceration possible; potential incr. risk of HIV infection</li> </ul>	<ul style="list-style-type: none"> <li>▪ No surfactant properties; non-irritant; does not increase infection risk</li> </ul>
	Sulphated carbohydrates	<ul style="list-style-type: none"> <li>▪ Not active against clinical HIV strains</li> </ul>	<ul style="list-style-type: none"> <li>♦ Highly active against all HIV strains tested</li> </ul>
	Reverse Transcript. Inhibitors and other anti-viral drugs	<ul style="list-style-type: none"> <li>▪ Drug resistance is an issue</li> <li>▪ Primary mode of action requires infection process to have begun</li> <li>▪ Not active against herpes</li> </ul>	<ul style="list-style-type: none"> <li>▪ Very high barrier to development of viral resistance</li> <li>▪ Primary mode of action is prevention of virus attachment</li> <li>▪ Potent activity against herpes</li> </ul>
	Sulphated Polymers	<ul style="list-style-type: none"> <li>▪ High cost of synthesis</li> <li>▪ Poor characterisation of the drug substance likely to present regulatory issues</li> </ul>	<ul style="list-style-type: none"> <li>▪ Excellent drug characteristics:                             <ul style="list-style-type: none"> <li>▪ Low manufacturing costs</li> <li>▪ Stable, well defined entity</li> </ul> </li> </ul>
	Acidity Control Agents	<ul style="list-style-type: none"> <li>▪ Acidity control: sufficient protection as mono-therapy?</li> </ul>	<ul style="list-style-type: none"> <li>▪ Potent activity against HIV and HSV-2 in animal models; non-irritant</li> </ul>

# VivaGel™ : Potent Contraceptive Activity in Rabbits

- Recent study has shown that SPL7013, the active ingredient in its VivaGel™, exhibits a potent contraceptive effect in rabbits
- Independent study undertaken at Johns Hopkins University under an NIH grant
- Fertility was reduced by more than 75% by SPL7013 in a VivaGel™ formulation and 95% in a HEC gel compared with an inactive gel
- If contraceptive activity is confirmed in humans it would allow for development with contraception as an additional claim
- Findings relevant to both the stand-alone gel and condom coating opportunities

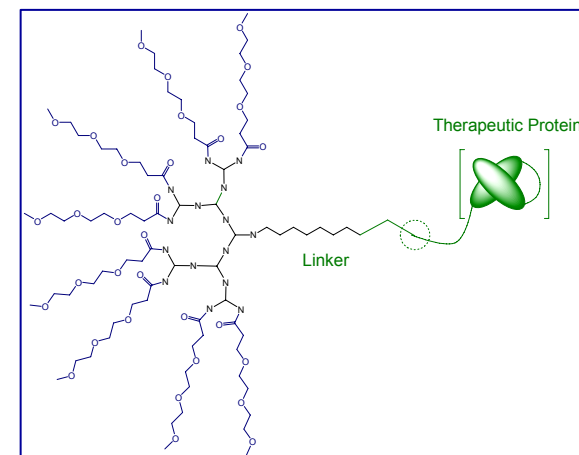
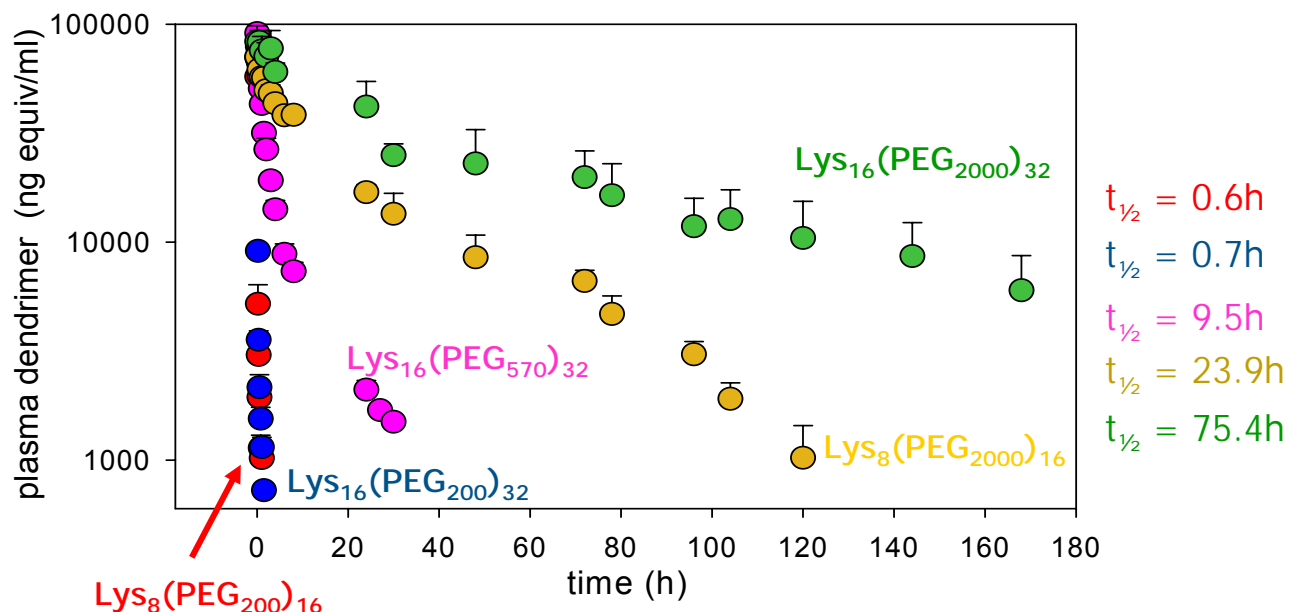
Average No. of Embryos Conceived Per Animal Following Application of Vaginal Gels, and % Relative Fertility in Active Gel-Treated Rabbits Compared with HEC Control



\* N-9 figure based on published historical data, Castle et al, Contraception 1998;58:51-60, and Zeitlin et al, Sexually Transmitted Diseases, 2001;28:417-23

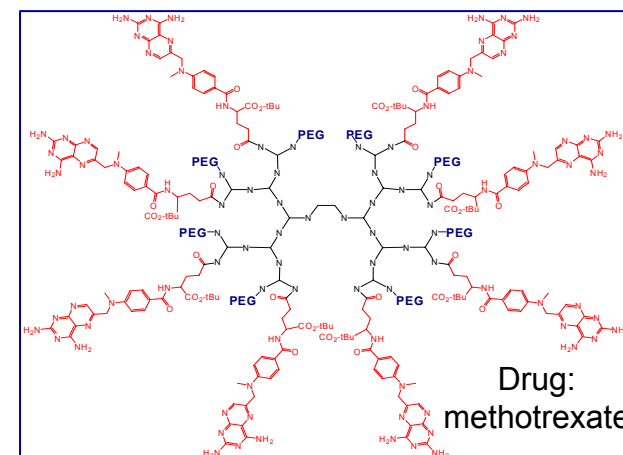
VivaGel™'s active ingredient is a potent contraceptive in animals

Plasma concentration-time profile in male SD rats for PEGylated poly-L-lysine dendrimers



Starpharma's dendrimers can be designed to optimize the Pharmacokinetics (PK) of:

- Small molecule drugs
- Therapeutic proteins
- Peptides
- Plasma residence time increases with dendrimer size, but:
  - PEG MW alone not the main determinant of  $t_{1/2}$



## *Transaction Details*

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- **Starpharma to acquire the remaining 67% equity in DNT that it does not already own for new shares in Starpharma valued to ~US\$6.97 million**
- **Transaction is subject to shareholder approval in majority of each DNT share class**
  - Between then Dow and SPL hold the majority in each class of shares
  - Estimated closure date: October 20, 2006
- **Consideration shares issued by Starpharma will be 20.097M (13.6% of shares on issue)**
- **Starpharma has agreed an arrangement with Dow for existing royalty streams - for up to 5 years - providing Dow maintains its shareholding in Starpharma**
- **Dow has agreed to enter into a tiered escrow arrangement over its holding in Starpharma**
  - Release of escrowed shares : 25% after 12 months, 25% after 24 months and 50% after 36 months
- **Other shareholder escrow arrangements:**
  - 12 months for DNT shareholders with more than 5% of the total share capital of DNT
  - 6 months for all other DNT shareholders

## *Overview of DNT Inc.*

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- DNT is a leading developer and provider of advanced dendritic polymers
  - headquartered in Michigan and currently employs 16 (13 Ph.Ds)
- DNT has existing revenues streams from deals with leading pharmaceutical and biotechnology companies including Dade Behring Inc and Qiagen GmbH (Germany)
- The company also has funding from the U.S. NCI and Small Business Administration for Priostar™ based ovarian cancer diagnostic delivery development
- DNT has developed a new family of scalable, precision dendrimer nanostructures called Priostar™, which breaks through cost barriers and addresses industry needs for nanostructures that can be manufactured in high volumes at costs attractive for a wide variety of uses
- The company has an active development portfolio:
  - PrioFect™: Transfection reagents for siRNA
  - Targeted Ovarian Cancer Diagnostic technology based on Priostar™ dendrimers (NCI funded)
  - Specialty commercial applications



## *Extensive IP Portfolio*

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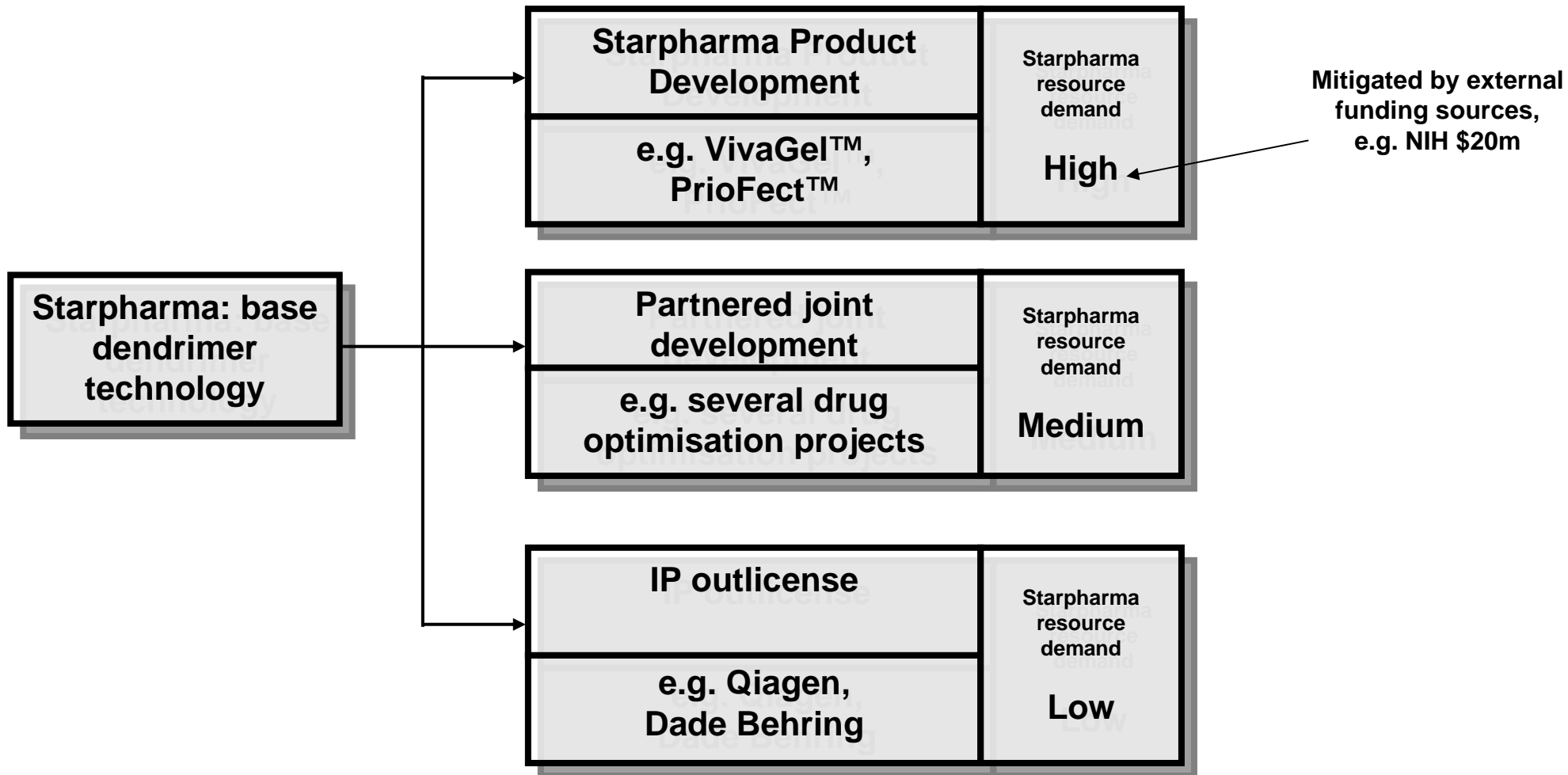
- **DNT owns the most significant dendrimer IP portfolio as a result of the assignment of Dow's dendrimer IP portfolio in 2005**

*“When it comes to pharmaceutical applications, many relevant patents are under the exclusive control of one company, DNT... it presents DNT as a clearinghouse for licensing core building block and manufacturing claims needed to put dendrimers to work”*

Lux Research 2005

- **With the acquisition of DNT, Starpharma will have the most comprehensive dendrimer IP portfolio for a broad spectrum of products and applications:**
  - VivaGel™ (Composition and Application)
  - Drug delivery (Applications)
  - Priostar™ dendrimers (Composition)
  - Poly-lysine dendrimers (Applications)
- **Consolidation of the combined IP portfolio will significantly enhance the company's offering and profile to potential commercialisation partners**

## Development approach



Combination of “in house”, partnered and 3<sup>rd</sup> party development maximises IP exploitation

- **DNT is developing a Priostar™ dendrimer-based , receptor-targeted diagnostic and therapeutic technology for the early detection and treatment of ovarian cancer**
  
- **Unique technology:**
  - **Priostar™ dendrimer targeted delivery system will be combined with a magnetic resonance imaging agent to create an improved product for detection and monitoring of cancerous tissue**
  - **Potential for Priostar™ dendrimer targeted delivery system to be combined with known oncology agents to improve delivery of the therapy**
  
- **Funded by the National Cancer Institute**
  
- **Significant synergies with Starpharma’s diagnostic and oncology programs**

# DNT: Specialty Commercial Products

- **Priostar™ and STARBURST® dendrimers commercially available**
- **Priostar™ family of dendrimers have advantageous properties over other nanostructures**
- **Attractive Product Characteristics:**
  - **New Functionality and Improved Properties**
  - **Efficient & Scalable Manufacturing - Lower Costs**
  - **Versatile Platform for Customizing**

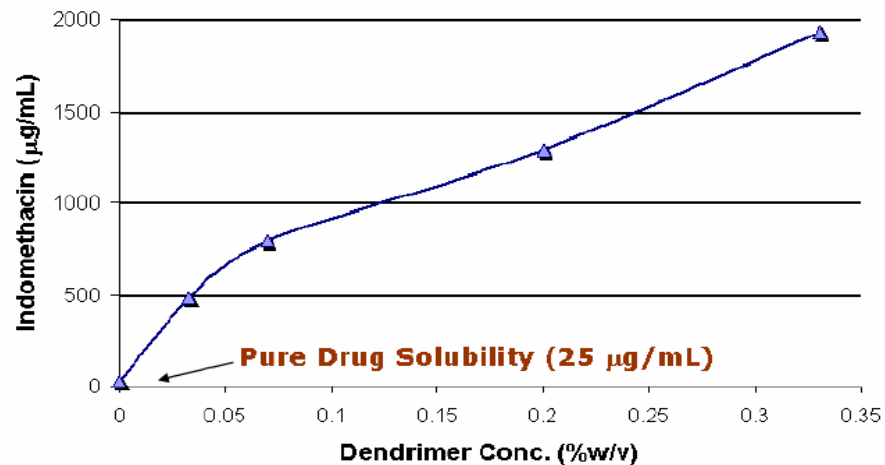
Available Priostar™ Products

Product	Size	Number of Functional Groups	Surface Functionality
DNT-2200	G1	8	Amine
DNT-2201	G2	24	Amine
DNT-2202	G3	72	Amine
DNT-2210	G1	8	Hydroxy
DNT-2211	G2	24	Hydroxy
DNT-2212	G3	72	Hydroxy
DNT-2220	G1	8	Sodium Carboxylate
DNT-2221	G2	24	Sodium Carboxylate
DNT-2222	G3	72	Sodium Carboxylate

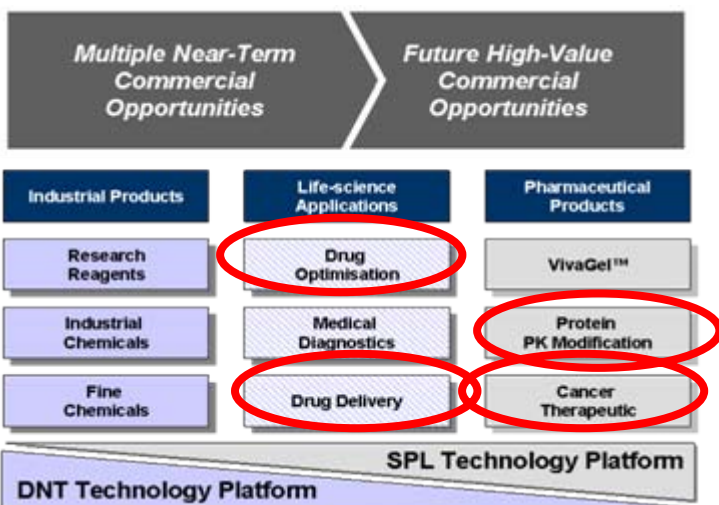
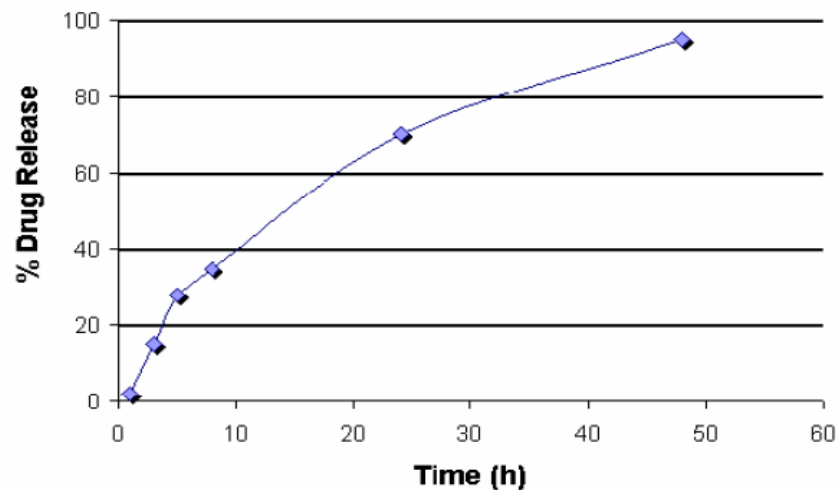


Extract from DNT Catalogue

Enhanced Solubility of Indomethacin Using Dendrimers



Controlled Drug Release Using Dendrimers



\*PK: pharmacokinetics